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54 Speed detecting device for non-driving wheels of vehicles.

57 A speed detecting device for non-driving wheels of vehicles consists of a sensor (24) and of a phonic wheel (25) respectively mounted on the axle (10) and on a flanged body (14) carrying the wheel; the balls of a rolling bearing are interposed between the axle (10) and the body (14) for realizing the reciprocal rotation of said elements; the sensor (24) is mounted on the head (21) of a tang (18) which is slipped into a through hole of the axle for being

electrically connected to the vehicle's computer; the balls of the bearing (13) are mounted on inner races (12) fitted on the axle and axially held by blocking means (16, 17) that are screwed on the end (15) of the axle (10) facing the head (21) of the tang (18); the head (21) has a peripherically waved surface so as to copy corresponding side waves of said blocking means (16, 17) for simplifying the orientation of the sensor (24) when the unit gets assembled.

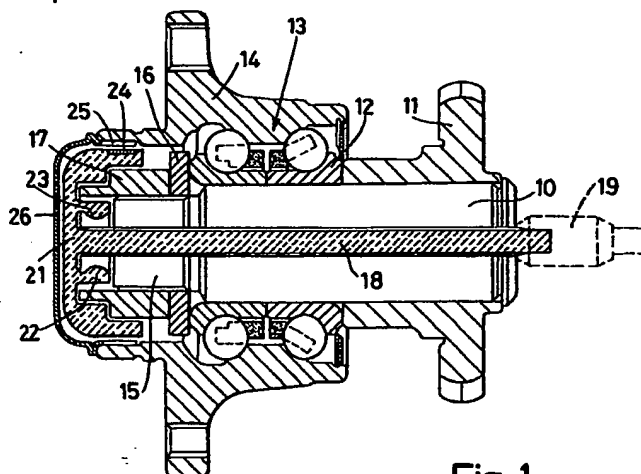


Fig.1

EP 0 447 641 A1

SPEED DETECTING DEVICE FOR NON-DRIVING WHEELS OF VEHICLES.

This invention is referred to a speed detecting device for non-driving wheels of vehicles.

The common widespread speed detecting systems for vehicle wheels consist of a sensor and a phonic wheel, and applied on the bearing of the wheel-hub, they should have the following characteristics:

- be easily mounted on the bearing;
- keep a correct and constant positioning in time, in radial, axial and circumferential directions;
- have the possibility of being easily and quickly disassembled in the case of a breakdown of the same devices or of the members that are connected with them;
- be easily and reliably connected with the vehicle's computer;
- the sensor must be protected from external contaminating elements;
- the electronics must be sheltered from crashes and as far as possible from all heat sources.

The actual solutions have only a few of the foregoing characteristics, combined in between them in various ways.

However, the first two above mentioned vehicle's computer; the balls of the bearing (13) being mounted on inner races (12) fitted on the axle and axially held by blocking means (16, 17) for simplifying the orientation of the sensor (24) when the unit gets assembled; furthermore, the head (21) having ulterior appendixes (22, 29) that engage the axle (10) in its blocking means (16, 17) so has to guarantee the axial end circumferential centering of the head itself.

The device according to the invention is now going to be described in two alternative embodiments, referring to the enclosed drawings, in which:

figs. 1 and 2 are axial cross sections of a wheel hub having the device according to this invention;

figs. 3 and 4 are drafts showing details of figs. 1 and 2.

Traditionally a wheel hub is provided with an axle 10 that is slipped into an axle holder 11 and on which the inner races 12 of a bearing 13 are fixed. The outer race of the bearing is formed by wheel-holder body 14.

The axle 10 has an end 15 with a restricted cross section on which a washer 16 is slipped; this is meant to compact the inner races 12 of the bearing 13 against the axle-holder 11.

A nut 17 is screwed on the threaded end 15 so as to block the above described unit.

Referring now expressly to the embodiment of

figs. 1 and 3, the nut 17 is a traditional one, with a final length that, after the screwing, is pressed down into a milled seat obtained in the end 15 of the pin 10.

This operation, that is traditionally used, prevents the nut 17 from unscrewing off the axle 10 while it is working.

According to this invention, the speed detecting device consists of a tang 18 made of sufficiently rigid material and which is slipped in a through hole of the axle 10. This tang leads the electronics towards the inside; these are to be connected with the computer by means of a connector 19 which is fitted on the outside of the axle 10.

The tang 18 has a head 21, the front shape of which is schematically shown in fig. 3. This shape allows it to be mounted on nut 17 so that it can cover with its hollow parts 20 the above mentioned pressed down part of the nut. In this way it is kept centered position with respect to the nut itself and it can be easily oriented in the right way during the assembly.

Tongues 22 are obtained inside head 21 for axially and circumferentially blocking tang 18; said tongues slip into the corresponding slots 23 of the end 15 of the axle 10.

The head 21 of the tang 18 holds the sensor 24 which is electrically connected to the computer through the tang 18 and is facing the phonic wheel 25. This can be mounted directly on the inside of body 14 or as an appendix of the lid 26 that covers the unit for protecting it from crashes and external contaminating elements.

In the embodiment of figs. 2 and 4 the nut 17 has no portions that crush, so the circumferential blockage of head 21 is realized by simply forming a waved circumferential surface 27 (fig. 4) on the washer 16 on which the head 21 spring locks. For such purpose, the head 21 will be provided with a circumferential undercut obtained on one of its cylindrical appendixes 28. The tongues 29 on the end of the cylindrical appendix 28 realize the blocking in the axial direction of the head 21, that is they prevent it from being accidentally untightened.

It is obvious that this realization is also equivalent in the frequent case in which the nut 17 and the washer 16 are integral.

Both of the above-described embodiments allow to mount the speed detecting device extremely simply and quickly, and realize a precise centering and positioning, both circumferentially and axially, as it is in the purposes of this invention.

If necessary, in case of maintenance or breakdown, it is quite easy to release the head 21 from

its axial and circumferential restraints as the head 21 and the tang 18, although being rigid, are lastically yielding, for example in plastic material.

Claims

1. A speed detecting device for non-driving wheels of vehicles consisting of a sensor (24) and of a phonic wheel (25) mounted respectively on the axle (10) and on a flanged body (14) carrying the wheel; the balls of a rolling bearing being interposed between the axle (10) and the body (14) for realizing the reciprocal rotation of said elements; the sensor (24) being mounted on the head (21) of a tang (18) which is slipped in a through hole of the axle for being electrically connected to the vehicle's computer; the balls of the bearing (13) being mounted on inner races (12) fitted on the axle and axially held by blocking means (16, 17) for simplifying the orientation of the sensor (24) when the unit gets assembled; furthermore, the head (21) having ulterior appendixes (22, 29) that engage the axle (10) in its blocking means (16, 17) so as to guarantee the axial and circumferential centering of the head itself.

2. A device according to claim 1 in which the blocking means consist of a washer (16) slipped on the end (15) of the axle (10), pressed against the inner races (12) of the bearing (13) by means of a nut (17) that is screwed on the threaded end (15) of axle (10); the nut (17) having peripheral surfaces suitable to be pressed down on corresponding seats of the end (15) of the axle (10); characterized in that the head (21) has a substantially circular shape and is provided with two diametrically opposed hollows (20) that copy the pressed down parts of the nut (17) on the end (15).

3. A device according to claim 1 characterized in that the appendixes for engaging axially the head (21) are tongues (22) that extend from its inside and are rounded towards the axle (10) so as to engage corresponding slots (23) of the axle itself.

4. A device according to claim 1 characterized in that the blocking means consist of a washer (16) slipped on the end (15) of the axle (10), and pressed against the inner races (12) of the bearing (13) by means of a nut (17) that is screwed on the threaded end (15) of the axle; characterized in that the washer (16) has a substantially circular waved periphery (27) that is made to fit inside a corresponding undercut obtained in a cylindrical appendix (28) of the

head (21); the circular extremity of head (21) contacting axially said periphery (27) of the washer (16).

5. A device according to claims 2 and 4 characterized in that the nut (17) and the washer (16) are realized as a whole in one piece.

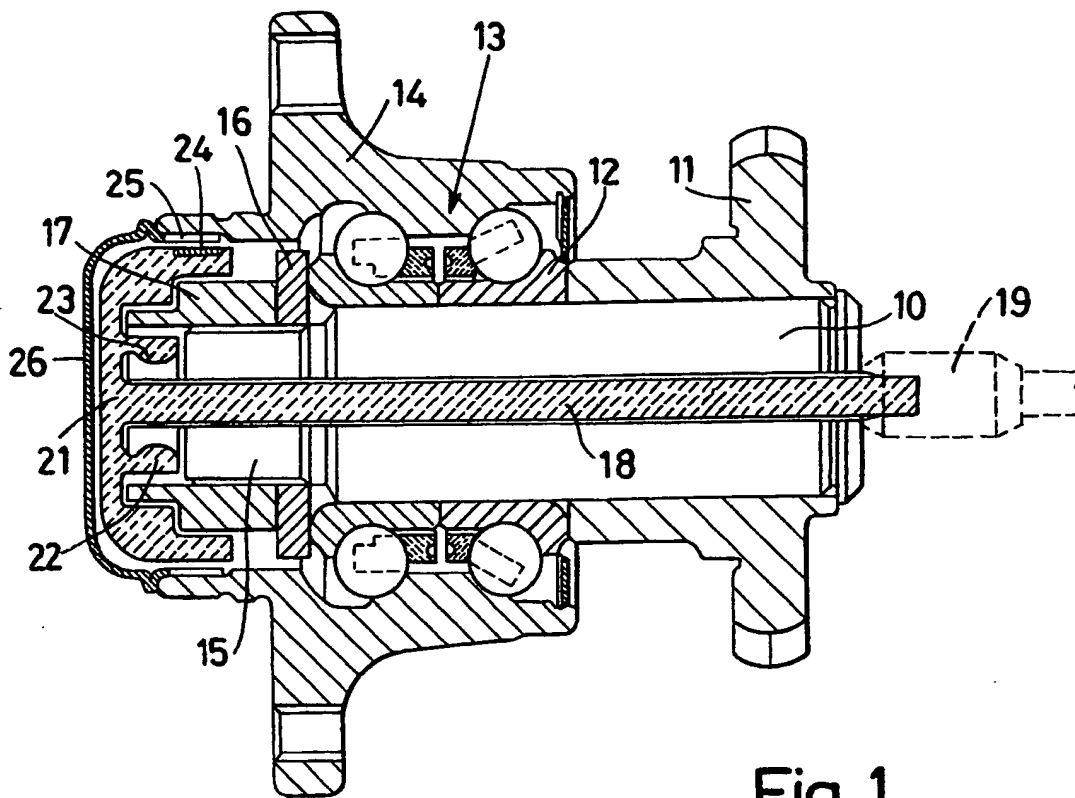


Fig. 1

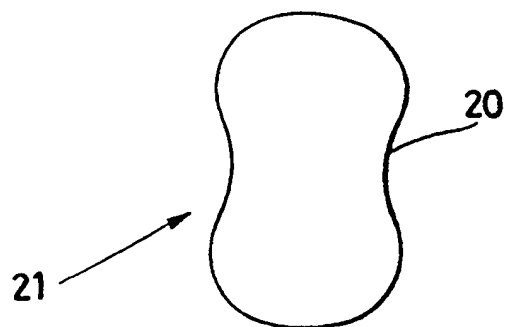
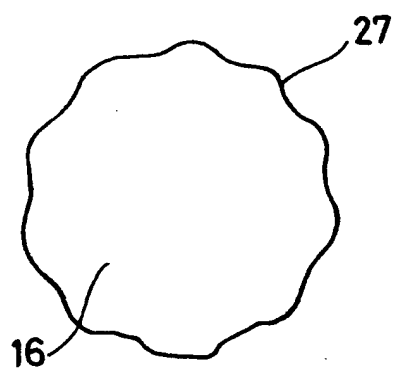
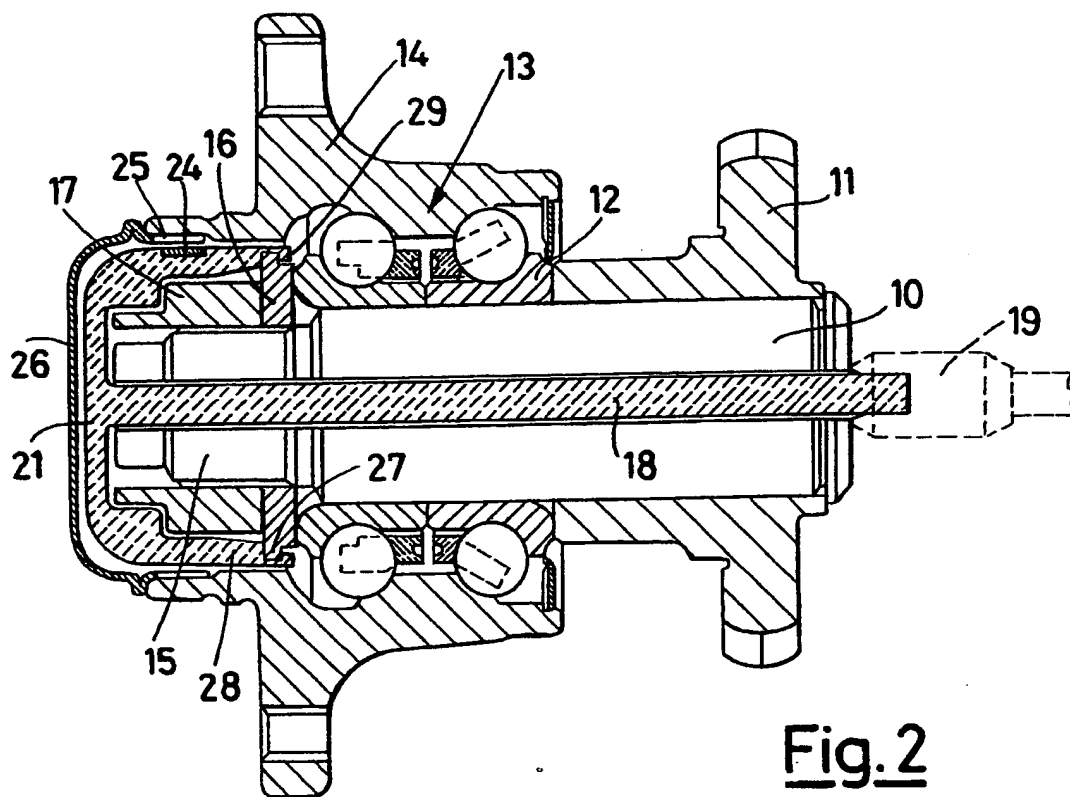


Fig. 3





European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 12 4090

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
| A | DE-U-8 816 381 (FAG KUGELFISCHER) * Page 3, line 29 - page 4, line 17; figures 1,2 * - - - - | 1,2,4,5 | G 01 P 3/44 |
| A | EP-A-0 317 423 (SKF FRANCE) * Column 3, lines 58-62; figure 1 * - - - - | 1,5 | |
| A | EP-A-0 323 159 (KOYO SEIKO CO., LTD) * Column 3, lines 39-41; figure 1 * - - - - - | 2 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.5) |
| | | | G 01 P |
| The present search report has been drawn up for all claims | | | |
| Place of search The Hague | | Date of completion of search 17 June 91 | Examiner HANSEN P. |
| <div>CATEGORY OF CITED DOCUMENTS</div> <div>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</div> <div>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document</div> | | | |